

# THE DISTRIBUTION OF SHORE FLIES (DIPTERA: EPHYDRIDAE) IN ILLINOIS<sup>1</sup>

B.A. Steinly<sup>2</sup>, E. Lisowski<sup>3</sup>, D. Webb<sup>3</sup>

**ABSTRACT:** New state and/or habitat records are reported for *Ephydra cinerea*, *Ditrichophora exigua*, *Lemnaphila scotlandae*, *Lytogaster excavata*, *L. furva*, *Nostima scutellaris*, *Paralimna punctipennis*, *Polytrichophora orbitalis*, *Pseudohecamele abdominalis*, *Psilopa dupla*, *Scatella obsoleta*, *S. quadrinotata*, *S. stagnalis*, and *Scatophila unicornis* (Diptera: Ephydriidae). Notably, *Scatella obsoleta*, and *S. stagnalis* were collected in a hydroponics greenhouse.

Many species of Ephydriidae (Diptera) are found in semi-aquatic and aquatic habitats. The ecology and distribution of shore flies have been investigated in aquatic habitats in Iowa (Deonier, 1965), and Ohio (Scheiring and Foote, 1973; Deonier and Regensburg, 1978; Steinly and Deonier, 1980; Steinly, 1986). In addition, ephydrid habitats and population composition have been studied within limited geographic areas in North Dakota (Harris and Deonier, 1979), California (Barnby and Resh, 1984), Washington (Zack, 1979, 1983) and Ohio (Steinly, 1978, 1984a and b). These Nearctic habitats are delimited by vegetation types, substratum conformation, and surface water abundance. Thus, while shore flies have received much attention, the majority of ephydrid ranges, habitat distributions, and population characteristics are unknown.

In this paper, we present new state (SR) and habitat (HR) records. The distributions of selected ephydrid species are discussed.

## METHODS

Adult shore flies were collected with a modified aerial sweep net (Regensburg, 1977). In the field, selected adults were aspirated into 7-dram vials, and the remaining adults in the collecting bag were killed with ethyl acetate. Adult specimens were point-mounted in the laboratory and examined to determine reproductive condition.

*Lemnaphila scotlandae* Cresson eggs and larvae were removed from field-collected samples of *Lemna minor* Linnaeus (duck weed) and placed in beakers of pond water at room temperature. Eggs were left on the duckweed thallus to facilitate handling. Larvae found mining duck weed were

---

<sup>1</sup>Received February 23, 1987. Accepted March 31, 1987.

<sup>2</sup>Department of Entomology, University of Illinois 320 Morrill Hall, 505 S. Goodwin, Champaign, Illinois 61801

<sup>3</sup>The Illinois Natural History Survey, Natural Resources Bldg., Champaign, Illinois 61820

transferred to holding beakers without removing them from the thallus. Also, free-floating puparia were collected from field samples and placed in holding beakers. Newly emerged adults of *L. scotlandae* were aspirated into vials, killed with ethyl alcohol, and pointmounted.

Specimens designated INHS were examined from the Illinois Natural History Survey Collection, Champaign, Illinois. Voucher specimens of field-collected material have been deposited in the INHS collections.

## RESULTS

For the first time, *Ephydra cinerea* Jones, *Ditrichophora exigua* Cresson, *Ilythea spilota* (Curtis), *Lemnaphila scotlandae* Cresson, *Nostima scutellaris* Cresson, *Paralimna punctipennis* (Wiedemann), *Polytrichophora orbitalis* (Loew), *Pseudohecamede abdominalis* (Williston), *Psilopa pulchripes* Loew, and *Scatophila unicornis* Czerny are reported from Illinois (Table I). New habitats have been recorded for *Lytogaster excavata* (Sturtevant and Wheeler), *L. furva* Cresson, *Pa. punctipennis*, *Po. orbitalis*, *Ps. dupla* Cresson, *Scatella obsoleta* Loew, *S. quadrinotata* Cresson, *S. stagnalis* (Fallén), and *Scatophila unicornis*. Notably, *Lemnaphila scotlandae* was collected from duck weed and *E. cinerea* was associated with salt habitats. *Scatella obsoleta* and *Sc. stagnalis* were collected in a hydroponics greenhouse.

### *Ephydra cinerea* Jones

Patoka, Ill., in salt pool, July-19-1945, 29 adults, Ross. and Sand., INHS. (SR)

### *Ditrichophora exigua* Cresson

Vermilion Co., Forest Glen Forest Preserve, 7 mi SE Westville, VI-25-1984, B.A. Steiny, grass shore, 3 adults. (SR)

### *Ilythea spilota* (Curtis)

Vermilion Co., Forest Glen Forest Preserve, 7 mi SE Westville, VI-25-1984, B.A. Steiny, Woodland stream, silt impregnated sand, 5 adults. (SR)

### *Lemnaphila scotlandae* Cresson

Vermilion Co., Forest Glen Forest Preserve, 7 mi SE Westville, IX-20-1986, B.A. Steiny, *Lemna minor* (Duck Weed), 10 adults and 47 larvae; Clay Co., Buck Creek, Sta. 3, 4.1 km (2.5 mi) NNE Flora, T3N, R7E, Sec 18 SW/4, IX-16-1986, B.A. Steiny and E.A. Lisowski, Duck Weed, 7 adults; Buck Ck., Sta. 6, 7.1 km (4.4 mi) NE Flora, T3N, R7E, Sec 9, NE/4, SE/4, NW/4, IX-16-1986, E.A. Lisowski and B.A. Steiny, 1 adult and 31 larvae; Grundy Co., 0.6 mi S Morris, SE/4, NE/4, SE/4 Sec 9, TssN, R7E, IX-21-1986, E.A. Lisowski, Duckweed, 14 larvae and 3 puparia; La Salle Co., I and M Canal, 1 mi W Utica SW/4 Sec 8, T33N, R2E, IX-21-1986, E.A. Lisowski, Duckweed, 27 larvae; La Salle Co., Illini State Park, 0.8 mi SE Marseilles, SE/4, NW/4 Sec 19, T33N, R5E, IX-21-1986, E.A. Lisowski, 15 larvae. (SR)

### *Lytogaster excavata* (Sturtevant and Wheeler)

Vermilion Co., Forest Glen Forest Preserve, 7 mi SE Westville, VI-25-1984, B.A. Steiny, Sedge Meadow, *Scirpus* sp., 18 adults. (HR)

- Lytogaster furva* Cresson  
Vermilion Co., Forest Glen Forest Preserve, 7 mi SE Westville, VI-18-1986, B.A.  
Steinly, Sedge Meadow *Scirpus* sp., adult. (HR)
- Nostima scutellaris* Cresson  
Vermilion Co., Forest Glen Forest Preserve, 7 mi. SE Westville, VI-25-1984, B.A.  
Steinly, Grass shore adjacent to woodland stream in ravine, 1 adult. (SR)
- Paralimna punctipennis* (Wiedemann)  
Vermilion Co., Forest Glen Forest Preserve, 7 mi SE Westville, VIII-18-1986, B.A.  
Steinly, Sedge meadow, 3 adults. (SR & HR)
- Polytrichophora orbitalis* (Loew)  
Vermilion Co., Forest Glen Forest Preserve, 7 mi. SE Westville, VII-13-1986, B.A.  
Steinly, silt impregnated sand, 5 adults. (SR & HR)
- Pseudohecamea abdominalis* (Williston)  
Mason Co., Illinois River, Havanna. (INHS), 1 adult. (SR)
- Psilopa dupla* Cresson  
Vermilion Co., Forest Glen Forest Preserve, 7 mi. SE Westville, V-21-1986, 41 adults;  
V-29-1986, 47 adults; VI-15-1986, 34 adults; VIII-18-1986, 15 adults; IX-20-1986, 6  
adults; X-6-1986, 4 adults B.A. Steinly, Terrestrial mowed grass. (HR)
- Psilopa pulchripes* Loew  
Champaign Co., Urbana, Ill., I-II-1986 (INHS), 1 adult; Lake Co., Waukegon, VIII-21-  
1917 (INHS), 1 adult; St. Clair Co., Centerville, VIII-18-1914 (INHS), 1 adult. (SR)
- Scatella obsoleta* Loew  
Macon Co., Decatur, V-10-1986 (D. Webb) (INHS), Hydroponics greenhouse, 1 adult,  
2 puparia. (HR)
- Scatella quadrinotata* Cresson  
Vermilion Co., Forest Glen Forest Preserve, 7 mi. SE Westville, VI-13-1986, B.A.  
Steinly, duck weed on mud, 1 adult. (HR)
- Scatella stagnalis* (Fallen)  
Macon Co., Decatur, XI-7-1986 (D. Webb), Hydroponics greenhouse, 50 adults,  
(INHS). (HR)
- Scatophila unicornis* Czerny  
Du Page Co., Lisle, (INHS), greenhouse, 1 adult. (SR & HR)

## DISCUSSION

*Psilopa dupla* was consistently collected from May through October, and gravid females from late May through August, 1986. At Forest Glen Forest Preserve, *P. dupla* specimens were not collected in the adjacent undisturbed marsh-reed and grass shore habitats. In southern Ohio, a few *P. dupla* and *P. compta* (Meigen) were found in a terrestrial mowed grass habitat that had thick mats of grass clippings (Steinly and Runyan, 1979; Steinly, 1984b). During 1976, *P. girschneri* von Röder was very abundant in two northern Ohio habitats (Steinly, 1979) that had prominent accumulations of decaying vegetation. Association with decaying vegetation, reproductive condition, and frequency of collection suggests that *Psilopa* species have encountered favorable breeding conditions in disturbed terrestrial grass habitats.

Although numerous *Ephydra cinerea* Jones specimens were found in the INHS collection, attempts to locate viable populations in Illinois proved futile. This halophilic species was very abundant in a single salt habitat at Rittman, Ohio (Steinly, 1979). In all probability, the distribution of *E. cinerea* has decreased because of the reduction in the number of brine storage ponds (natural basins) in Illinois oil fields. The elimination of salt brine holding ponds does not preclude the possibility that *E. cinerea* may be found in less conspicuous or accessible salt habitats.

*Lemnaphila scotlandae* Cresson has been reported from New York (Cresson, 1933), Michigan (Wirth, 1965), and Ohio (Deonier and Regensburg, 1978). During October of 1986, *L. scotlandae* was reared from *Lemna minor* (duck weed) obtained from four widely separated Illinois localities. The Illinois records constitute a significant range extension. The October collection of *L. scotlandae* eggs, larvae, and puparia suggests that breeding continues into late fall in the presence of viable duck weed populations.

TABLE I  
New state and habitat records for the Ephydriidae (Diptera) in Illinois.

Species	County and Habitat	Records
<i>Ephydra cinerea</i> Jones	Marion Co., salt pool (INHS) <sup>1</sup>	SR <sup>2</sup>
<i>Ditrichophora exigua</i> Cresson	Vermilion Co., grass shore	SR
<i>Illythea spilota</i> (Curtis)	Vermilion Co., woodland stream, silt impregnated mud	SR
<i>Lemnaphila scotlandae</i> Cresson	Vermilion Co., Clay Co., Grundy Co., La Salle Co., <i>Lemna minor</i>	SR
<i>Lytogaster excavata</i> (Sturtevant and Wheeler)	Vermilion Co., sedge meadow, <i>Scirpus</i> sp.	HR <sup>3</sup>
<i>L. furva</i> Cresson	Vermilion Co., sedge meadow, <i>Scirpus</i> sp.	HR
<i>Nostima scutellaris</i> Cresson	Vermilion Co., grass shore adjacent to woodland stream	SR
<i>Paralimna punctipennis</i> (Wiedemann)	Vermilion Co., sedge meadow	SR&HR
<i>Polytrichophora orbitalis</i> (Loew)	Vermilion Co., silt impregnated sand	SR&HR

Species	County and Habitat	Records
<i>Pseudohecamede abdominalis</i> (Williston)	Mason Co., habitat unknown (INHS)	SR
<i>Psilopa dupla</i> Cresson	Vermilion Co., terrestrial mowed grass	HR
<i>P. pulchripes</i> Loew	Champaign Co., Lake Co., St. Clair Co., habitat unknown (INHS)	SR
<i>Scatella obsoleta</i> Loew	Macon Co., hydroponic greenhouse (INHS)	HR
<i>S. quadrinotata</i> Loew	Vermilion Co., <i>Lemna minor</i> on mud	HR
<i>S. stagnalis</i> (Fallen)	Macon Co., hydroponic greenhouse (INHS)	HR
<i>Scatophila unicornis</i> Czerny	DuPage Co., greenhouse (INHS)	SR&HR

<sup>1</sup>INHS - Illinois Natural History Survey Collection

<sup>2</sup>SR - State Record

<sup>3</sup>HR - Habitat Record

#### ACKNOWLEDGMENTS

We wish to express appreciation to Dr. May Berenbaum for reviewing the final manuscript.

#### LITERATURE CITED

- Barnby, M.A. and V.H. Resh. 1984. Distribution and seasonal abundance of brine flies (Diptera: Ephydriidae) in a San Francisco Bay salt marsh. *Pan Pac. Entomol.* 60: 37-46.
- Cresson, E.T., Jr. 1933. A new genus and species of the dipterous family Ephydriidae reared from duck weed. *Entomol. News* 44: 229-231.
- Deonier, D.L. 1965. Ecological observations on Iowa shore flies (Diptera: Ephydriidae). *Proc. Iowa Acad. Sci.* 71: 496-510.
- Deonier, D.L. and J.T. Regensburg. 1978. New records of Ohio shore flies (Diptera: Ephydriidae). *Ohio J. Sci.* 78: 154-155.
- Harris, S.C. and D.L. Deonier. 1979. Ecological observations of immature Ephydriidae in North Dakota spring-brooks. pp. 111-121. *In: Deonier, D.L., ed., First Symposium on the Systematics and Ecology of Ephydriidae (Diptera)*. North Am. Benthol. Soc.
- Regensburg, J.T. 1977. A modified sweep net for quantitative sampling. *Entomol. News* 88: 141-142.

- Scheiring, J.F. and B.A. Foote. 1973. Habitat distribution of the shore flies of northeastern Ohio (Diptera: Ephydriidae). *Ohio J. Sci.* 73: 152-166.
- Steinly, B.A. 1978. New records of *Atissa* in Ohio (Diptera: Ephydriidae). *Entomol. News* 89: 107-108.
- Steinly, B.A. 1979. The shore flies of northern Ohio (Diptera: Ephydriidae). Unpubl. M.S. Thesis. Miami University, Oxford, Ohio. 249 pp.
- Steinly, B.A. 1984a. New habitat records for *Glenanthe* species (Diptera: Ephydriidae). *Entomol. News* 95: 45-47.
- Steinly, B.A. 1984b. Shore fly (Diptera: Ephydriidae) community structure in a xeric grass habitat. *Proc. Entomol. Soc. Wash.* 86: 749-759.
- Steinly, B.A. 1986. Violent wave action and the exclusion of Ephydriidae (Diptera) from marine temperate intertidal and fresh-water beach habitats. *Proc. Entomol. Soc. Wash.* 88: 427-437.
- Steinly, B.A. and D.L. Deonier. 1980. New records of Ohio shore flies (Diptera: Ephydriidae). *Ohio J. Sci.* 80: 41-42.
- Steinly, B.A. and J.T. Runyan. 1979. The life history of *Leptopsilopa atrimana* (Diptera: Ephydriidae), pp. 139-147. *In: Deonier, D.L., ed., First Symposium on the Systematics and Ecology of Ephydriidae* (Diptera). North Am. Benthol. Soc.
- Wirth, W.W. 1965. Family Ephydriidae, pp. 734-759. *In: Stone, A., et al., eds. A catalog of the Diptera of America north of Mexico.* U.S. Dept. Agric. Handbook 276, 1696 pp.
- Zack, R.S. 1979. Habitat distribution of the Ephydriidae (Diptera) of Mount Rainier National Park (Washington State), pp. 81-98. *In: Deonier, D.L., ed., First Symposium on the Systematics and Ecology of Ephydriidae* (Diptera). North Am. Benthol. Soc.
- Zack, R.S. 1983. Further notes on the shore flies (Diptera: Ephydriidae) of Mount Rainier National Park, Washington. *Northwest Sci.* 57: 212-223.
- 
- 

(Continued from page 162)

The Commission now invites nominations, by any person or institution, of candidates for membership. Article 2b of the Constitution prescribes that:

"The members of the Commission shall be eminent scientists, irrespective of nationality, with a distinguished record in any branch of zoology, who are known to have an interest in zoological nomenclature".

(It should be noted that 'zoology' here includes the applied biological sciences (medicine, agriculture, etc.) which use zoological names).

Nominations, giving the dates of birth, nationality and qualifications (by the criteria mentioned above) of each candidate should be sent by 31 March 1988 to: The Executive Secretary, International Commission on Zoological Nomenclature, c/o British Museum (Natural History), Cromwell Road, London, SW7 5BD, U.K.